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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/736,266	12/15/2000	Adalbert Feltz		8730

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EXAMINER

BLACKWELL RUDASIL, GWENDOLYN A

ART UNIT	PAPER NUMBER
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1775

DATE MAILED: 05/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 09/736,266	Applicant(s) FELTZ ET AL.	
	Examiner Gwendolyn A. Blackwell-Rudasill	Art Unit 1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on 12 February 2004.

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 36-42 and 45-82 is/are pending in the application.

4a) Of the above claim(s) 36-42 is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) 42-79, 81 and 82 is/are rejected.

7) ☒ Claim(s) 80 is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on 23 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☒ All b) ☐ Some * c) ☐ None of:

1. ☒ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. _____.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____	6) <input type="checkbox"/> Other: _____

U.S. Patent and Trademark Office
PTOL-326 (Rev. 1-04)

Office Action Summary

Part of Paper No./Mail Date 20040517

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 45-48 and 82 are rejected under 35 U.S.C. 102(e) as being anticipated by United States Patent no. 6,255,037, Kanoh et al.

Regarding claims 45-48 and 82

Kanoh et al disclose a monolithic piezoelectric part, (column 1, lines 5-10), wherein the part is comprised of laminated green sheets with an electroconductive film formed on each green sheet and the entire stack sintered after lamination, (column 2, lines 50-55). The green sheet has a thickness of 5-50 μm and is made from a slurry comprised of dispersing a powdery raw material in a solvent and binder, (column 5, lines 7-14). Copper is one of the materials used for the electroconductive layer, (column 10, lines 12-17).

3. Claims 45-48, 50-51, 59-61, 65, 67-68, and 70 are rejected under 35 U.S.C. 102(e) as being anticipated by United States Patent no. 6,320,738, Yamana et al.

Regarding claims 45-48 and 50-51

Yamana et al disclose a monolithic ceramic electronic parts such as a monolithic ceramic piezoelectric component comprised of alternating layers of a ceramic green sheet and metal electrode materials wherein the part has the incidence of pores in the ceramic layer being about

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1% or less, (column 2, lines 34-64), in addition to the green sheets and metal electrodes are sintered together, (column 3, lines 39-46). Copper is used for the internal electrode material, (column 13, lines 1-5).

Regarding claims 59-61, 65, 67-68, and 70

A specific example uses the perovskite ceramic of barium titanate wherein the oxides of dysprosium, magnesium, manganese and silicon are added to the barium titanate, (column 6, lines 24-33).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 49-79 and 81 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent no. 6,255,037, Kanoh et al as applied to claims 45-48 above, and further in

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view of United States Patent no. 4,128,489, Seo in view of United States Patent no. 4,917,810, Tsunooka et al, in view of United States Patent no. 5,112,433, Dawson et al, further in view of United States Patent no. 6,080,328, Horikawa.

Kanoh et al disclose a monolithic piezoelectric part, (column 1, lines 5-10), wherein the part is comprised of laminated green sheets with an electroconductive film formed on each green sheet and the entire stack sintered after lamination, (column 2, lines 50-55). The green sheet has a thickness of 5-50 μm and is made from a slurry comprised of dispersing a powdery raw material in a solvent and binder, (column 5, lines 7-14). Copper is one of the materials used for the electroconductive layer, (column 10, lines 12-17). Kanoh et al do not specifically disclose the composition of the perovskite structure as well as the grain size.

Seo discloses a piezoelectric material that utilizes a urethane rubber in the polymer binder mix, (column 2, lines 35-36). Further examples of the specific polymer that can be used are listed in Table 9, column 9. In addition, Example 7, set out that the formula of PZT satisfies the equation $\text{Pb}(\text{Zr}_2\text{Ti}_{1-x})\text{O}_3$, (column 8, lines 4-5).

Tsunooka et al discloses a piezoelectric composite material that can be used where "high piezoelectric properties may be required such as sonic transducers, physical property measurements, ferroelectric, pyroelectric or piezoelectric keyboard switches and so on," (column 26, lines 42-50). The composite contains ceramic powders that are "mixed with a wider variety of polymers," and molded into a shape, (column 5, lines 10-14). The particle size of the ceramic material ranges between 1-400 μ , (column 5, lines 28-38). As disclosed in the examples, in particular Example 1, the components of the ceramic powder should be 98% or higher in purity, (column 9, Example 1). Tsunooka et al also discloses that many different types of ceramic compositions that can be used. The perovskite structures that can be used are listed in columns

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6-67, lines 62-67). For example, solid solutions of lead titanate zirconate are made. Along with the lead titanate zirconate other cations can be present, on the A position, La, Na, K, or Bi can be present. On the B position, Nb, Ta, Mg, Ni, Co, Fe, Sc, or W can be present.

Dawson et al disclose submicron ceramic powder of perovskite compounds wherein the fine particle size of the powder is less than 1 with a sintering temperature of less than 1100°C, (column 2, lines 54-66). The perovskite structure can be based on barium titanate (BT), lead lanthanum zirconate titanate (PLZT), as well as lead zirconate titanate (PZT) wherein PZT describes the entire family of powders comprised of lead, zirconium, titanium and oxygen as principal elements, also including those compounds where the principal elements have been partially substituted with dopants, (columns 3-4, lines 1-46). The perovskite has the general formula of ABO_3 wherein A is of the group barium, strontium, calcium, magnesium, lead, lanthanum, bismuth, cerium, neodymium, samarium and any or all of the B elements hafnium, zirconium, titanium, niobium, uranium, iron, antimony, nickel, manganese, cobalt, tungsten, and tin, (column 9, lines 22-35). Example 1 demonstrates that the grain size of the ceramic powder ranges from 0.5-1.0 microns (0.5-1.0 μm), (column 17, lines 26-34).

Horikawa discloses a monolithic piezoceramic part comprised of laminating ceramic green sheets with internal electrode layers with subsequent firing of the laminated stack to produce a sintered product. The ceramic has the formula $Pb_a[(Cr_xNb_{(1-x)})_yZr_{(1-b-y)}Ti_b]O_3$ wherein a copper component such as CuO can be added in the amount of about 0.05-3.0wt % (column 2, lines 39-68).

Seo, Tsunooka et al, Dawson et al and Horikawa disclose inventions related to perovskite compositions having a lowered sintering temperature. Kanoh et al disclose a monolithic piezoelectric part comprised of ceramic green sheets and electrodes such as copper that are

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sintered together to create the monolithic structure. It would have been within the skill of one in the art at the time of invention to modify the monolithic piezoelectric part with one of the piezoelectric ceramic compositions of Seo, Tsunooka et al, Dawson et al or Horikawa to create a monolithic piezoelectric component wherein the electrodes can be fired at the same time as the green sheets to cut down on processing time as well as allowing less expensive materials to be used for the internal electrode materials, (Dawson et al, column 2, lines 63-66).

Response to Arguments

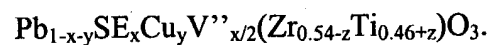
7. Applicant's arguments with respect to claim February 12, 2004 have been found persuasive with regards to US Patent nos. 5,233,260 Harada et al and 6,266,230 Kato et al with the rejections of those claims based upon the aforementioned references dropped. However, upon further consideration, a new ground(s) of rejection is made as set forth above.

8. The secondary references to United States Patent nos. 4,128,489, and 4,917,810 have been kept as prior art that is still pertinent.

Allowable Subject Matter

9. Claim 80 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record do not teach or suggest a ceramic composition comprised of

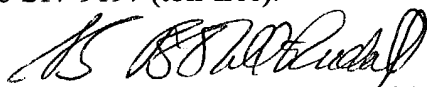


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gwendolyn A. Blackwell-Rudasill whose telephone number is (571) 272-1533. The examiner can normally be reached on Monday - Thursday; 6:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (571) 272-1535. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Gwendolyn A. Blackwell-Rudasill
Examiner
Art Unit 1775

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